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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/582,497	06/09/2006	Hirofumi Higashi	DK-US065113	2882
22919 7590 01/03/2011 GLOBAL IP COUNSELORS, LLP 1233 20TH STREET, NW, SUITE 700 WASHINGTON, DC 20036-2680			EXAMINER STIMPERT, PHIL/PEARL	
			ART UNIT 3746	PAPER NUMBER
			MAIL DATE 01/03/2011	DELIVERY MODE PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

### Office Action Summary

**Application No.**

10/582,497

**Applicant(s)**

HIGASHI, HIROFUMI

**Examiner**

Philip Stimpert

**Art Unit**

3746

**Period for Reply** -- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 29 October 2010.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1 and 3 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1 and 3 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 09 June 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-940)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

**DETAILED ACTION**

***Claim Rejections - 35 USC § 103***

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1 and 3 are rejected under 35 U.S.C. 103(a) as being unpatentable over US Patent 6,592,346 to Bushnell (Bushnell) in view of US patent 4,172,465 to Dashner (Dashner) and US PGPub 2002/0012696 to Kouno et al. (Kouno).

3. Regarding claim 1, Bushnell teaches a compressor (10) comprising a compression mechanism (see Fig. 2) configured to compress fluid and including a discharge port (42) and a reed valve (44). Bushnell teaches that the reed valve (44) is coupled to the compressor mechanism to open and close the discharge port (42) and that it includes a flat part and a rounded protruding part (see Fig. 5, protruding part extends into the discharge port 42 when the valve is closed, and the flat part is the rest of the valve body). Bushnell does not teach the area relation required by claim 1. Dashner teaches a check valve similar in effect to the reed valve of Bushnell. Dashner particularly teaches that "the housing of the check valve of the present invention is specially formed to provide smooth, generally constant fluid flow path therethrough to reduce substantially pressure loss of the fluid as it passes through the valve," (col. 2, ln. 41-46), and that this is accomplished by maintaining a constant cross-sectional area through the flow path of the valve. Therefore, it would have been obvious to one of

ordinary skill in the art at the time of the invention to modify the reed valve and valve seat of Bushnell such that the cross-sectional area of the flow path through the valve remains constant, to thereby reduce pressure loss and increase efficiency as taught by Dashner. The examiner notes that it is possible for all three recited areas to be equal and still satisfy the limitations of the claim, since the relation used is "greater than or equal to." Further, Dashner teaches that the valve seat (20) decreases in radius from the outlet to the inlet. Since this is part of the geometry which provides the desired constant cross-sectional area, it would be provided to the discharge port (42) of Bushnell in a combination with Dashner. Further, Dashner teaches that the protruding part is tapered toward a distal end thereof, and that it essentially matches the profile of the valve seat, in terms of slope, at the point of contact.

Neither Dashner nor Bushnell teach that an end face of the protruding part is substantially flush with a rim of the inlet of the discharge port. Kouno teaches a compressor having a discharge valve. In particular, Kouno teaches discharge valve bodies which are substantially flush with the inlets to the discharge ports (see Fig. 6(c)). Kouno teaches that this minimizes clearance and thus dead volume in the compression chamber, thereby improving performance of the compressor (paragraph 81). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to arrange the valve body and discharge port of Bushnell and Dashner such that it is substantially flush with the rim of the inlet to the discharge port, so as to improve performance. Further, the valve bodies taught by Dashner and in particular Kouno, are of substantially the same shape as the seats with which they come into contact to close

the valves. Finally, when in a closed position (such as during a suction cycle when the discharge valve is momentarily stationary), the space between a slope surface of the protruding part and a corresponding surface of the discharge port is unchanging, or constant, because the valve is not moving.

4. Regarding claim 3, Bushnell teaches a seat (56) formed at the outer periphery of the outlet of the discharge port such that the seat (56) contacts the flat part (see Fig. 6).

***Response to Arguments***

5. Applicant's arguments filed 29 October 2010 have been fully considered but they are not persuasive.

6. With respect to the amendment to claim 1, the examiner notes that "a constant space" is sufficiently broad as to continue to read on the combination proposed by the rejection. One interpretation of that language is used above.

7. With respect to the argument that because Dashner is not used in a compressor, that it cannot provide any reason to modify the valve member of Bushnell, the examiner disagrees. Dashner provides certain teachings regarding the utility of a constant cross-sectional area in check valves generally. One of ordinary skill in the art would appreciate that those teachings would apply equally to the valve of Bushnell. The fact that Dashner does not consider reducing dead volume is irrelevant, as those considerations are dealt with by Bushnell and Kuono.

8. With respect to the argument that Kuono is not a reed valve, and thus cannot provide motivation to modify such a reed valve, the examiner disagrees. Kuono provides teachings relative to dead space in a cylinder, a problem which is well known

in the art. It would be apparent that the same dead space considerations would apply to Bushnell, since Bushnell uses an expansible compression chamber. This would provide motivation for one of ordinary skill to modify the reed valve of Bushnell.

9. With respect to the argument that "the current record lacks any apparent reason, suggestion, or expectation of success for combining the patents," the examiner disagrees. Each proposed modification has been matched with a corresponding motivation to perform the modification, such as increased efficiency. These motivations are provided above.

### ***Conclusion***

10. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Philip Stimpert whose telephone number is (571)270-1890. The examiner can normally be reached on Mon-Fri 7:30AM-4:00PM, EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Devon Kramer can be reached on (571) 272-7118. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Devon C Kramer/  
Supervisory Patent Examiner, Art  
Unit 3746

/P. S./  
Examiner, Art Unit 3746  
30 December 2010